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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,150	01/14/2002	Armin Schoppach	(Z) 99038 P US	4347

7590 09/17/2003

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EXAMINER

PRITCHETT, JOSHUA L

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/047,150

Applicant(s)

SCHOPPACH ET AL.

Examiner

Joshua L Pritchett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-19 is/are rejected.
- 7) ☒ Claim(s) 10 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This action is in response to Amendment A filed June 20, 2003. Claims 1-3 have been canceled claims 4-6, 8-12 and 15-16 have been amended and claims 17-19 have been added as requested by the applicant.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-10 and 13-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 9-10, 13 and 15-16 depend either directly or indirectly from canceled claim 3. Claim 14 depends from canceled claim 1. For the sake of examination the claims will be examined as if they depended from claim 4, with the exception of claim 16 which will be examined as if it depends from claim 10 which depends from claim 4.

Claim 6 recites the limitations "the first optical element" and "the second optical element" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 4-6, 8-9 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Hull.

Regarding claim 4, Hull discloses an optical system comprising a mirror (13) comprising a mirror member carrying a surface (Fig. 7), which mirror member is connected to a further optical element (14) by a means of a mounting (18) and compensation elements (17).

Regarding claim 5, Hull discloses at least one of the optical elements comprising a lens (11, col. 4 lines 7-9).

Regarding claim 6, Hull discloses the optical system being a telescope (10) and the first optical element being a primary mirror (13) and the second optical element being a secondary mirror (14).

Regarding claim 8, Hull discloses the compensation elements connected to at least one of the optical elements, coaxially of an optical axis defined by the optical elements (Fig. 2).

Regarding claim 9, Hull discloses the compensation elements coaxially arranged with the primary mirror (Fig. 1).

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Regarding claim 11, Hull discloses the compensation elements (17) are supported on a mirror carrier (18) carrying the mirror surface of primary mirror (13) (Fig. 7).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Harnisch.

Hull teaches the invention as claimed including aluminum compensation elements (col. 6 lines 49-50) for the compensation means (17) but lacks reference to the claimed material for the mounting means (18). Harnisch teaches the use of C/C SiC with a density of $2.23 \times 10^3 \text{ kg/m}^3$ to construct the mounting means of a telescope (page 4 col. 1). Once the Hull mounting means (18) is made of the Harnisch material the compensation elements (17) and the mounting means (18) will inherently have different thermal expansion coefficients because they are made of different materials. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Hull mounting means made of the Harnisch material for the

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purpose of allowing the telescope to be lightweight and therefore portable without losing strength in the mountings.

Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Neil.

Hull teaches the invention as claimed including the use of aluminum (col. 6 lines 49-50) compensation elements (17), but lacks reference to the use of a silicon nitride mirror. Neil teaches the use of a silicon nitride mirror in temperature dependent optics (abstract lines 1-3). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Hull mirror be silicon nitride as taught by Neil for the purpose of using a mirror in a variety of temperature environments.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Atkinson.

Hull teaches the invention as claimed but lacks reference to the use of the mirror being created by replication technique. Atkinson teaches the use of creating a mirror using replication technique (abstract lines 17-19). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the mirror of Hull made by replication technique as taught by Atkinson for the purpose of inexpensive production costs.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Jutte (US 4,098,476).

Hull teaches the invention as claimed but lacks reference to either a quartz mirror or titanium compensation means. Jutte teaches the use of titanium supports to use thermal expansion to control the position of a mirror (col. 1 lines 62-68). A mirror made of quartz is well known and widely used in the art and one of ordinary skill would have recognized to use quartz to make the mirror of Hull. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the compensation elements of Hull comprise titanium as taught by Jutte for the purpose of using compensation elements with a large thermal expansion coefficient to allow rapid movement of the Hull mirror. It would further have been obvious to make the mirror out of quartz for the purpose of cheap and precise construction due to the well-known optical properties of quartz and the abundant supply of raw quartz material.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Meier (US 4,826,303).

Hull teaches the invention as claimed but lacks reference to the use of Zerodur and invar. Meier teaches the use of Zerodur (9; Fig. 3) in a mirror system for telescopes (col. 4 lines 33-35). Meier further teaches the use of invar to hold a mirror (col. 5 lines 36-38) and that the thermal expansion coefficient of the invar helps to determine temperature compensation of the mirror element (col. 5 lines 55-56). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the mirror system of Hull include Zerodur and the compensation elements to include invar as taught by Meier for the purpose of very precise movements of the mirrors of the telescope.

Allowable Subject Matter

Claims 10 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 10, claim 10 is allowable over the prior art of record because the prior art fails to teach a telescope with a telescope tube, a first and second mirror facing one another from opposite ends of the tube, a mounting means with a density of at most $2.5 \times 10^3 \text{ kg/m}^3$ and compensation elements capable of changing the distance between the first and second mirrors based on temperature dependence, the compensation means comprising at least three feet. The connection of the strut (17) to the mounting (18) in the Hull reference (Fig. 1a) does not teach or suggest the use of a compensation element connector comprising three feet.

Regarding claim 16, claim 16 depends from claim 10 and is therefore allowable for the same reasons as claim 10.

Response to Arguments

Applicant's arguments filed June 20, 2003 have been fully considered but they are not persuasive.

On pages 7-8 of Amendment A, applicant argues that there is no motivation to combine Hull and Neil. The examiner disagrees because both Hull and Neil deal with temperature dependent optics, and the use of the Neil mirror carrier in the Hull invention may prevent any distortion of the mirror image due to thermal expansion (Neil abstract lines 5-8).

On pages 8-9 of Amendment A, applicant argues that mounting of the current invention does not comprise compensation elements. The examiner does not understand this argument because the examiner does not state that the mounting (Hull, 18) comprises the compensation elements (Hull, 17). Clearly in Fig. 1a of Hull the reference shows that the mounting (18) does not comprise the compensation elements (17), but that the two are connected to one another.

On page 9 of Amendment A, applicant argues that Hull already has thermal expansion compensation; therefore it would not be obvious to change the materials of Hull. The examiner disagrees because the materials of Neil and Harnisch provide advantages over the materials of Hull such as decrease weight while maintaining the strength of the mounting (Harnisch) and preventing mirror image distortion (Neil).

On pages 9-10 of Amendment A, applicant argues that Neil does not teach the combination of materials in claim 4. Currently there exist no limitations in claim 4 dealing with materials; therefore this argument is moot.

On page 10 of Amendment A, applicant argues that Harnisch does not teach the combination of materials in claim 4. Currently there exist no limitations in claim 4 dealing with materials; therefore this argument is moot.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7917. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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JLP

August 27, 2003


DREW DUNN
SUPERVISORY PATENT EXAMINER